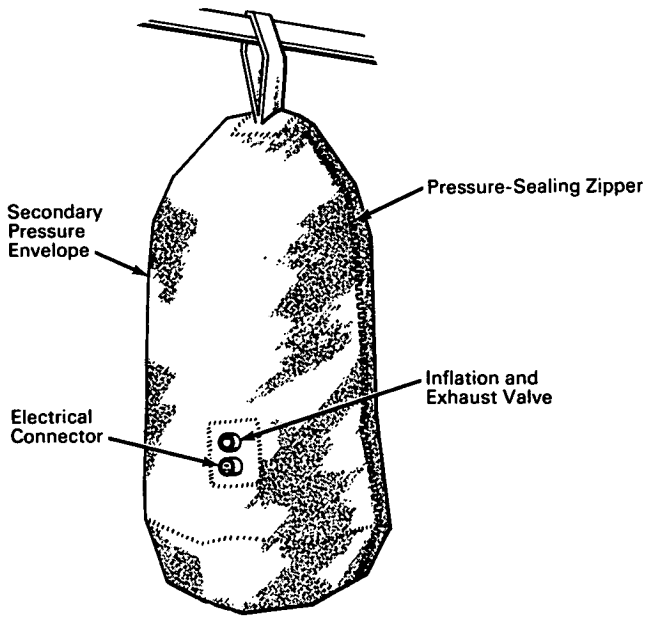
NASA TECH BRIEF

Portable Lightweight Cell Provides Controlled Environment



The problem:

To provide a separate, secondary safe environment capable of receiving a spacesuited man in the event of spacesuit damage or malfunction. The secondary environment must have enough room for its occupant to eat, drink, eliminate body wastes, and perform routine hygienic tasks.

The solution:

An inflatable, lightweight cell having a pressure-sealing zipper for entry and exit and which is equipped to maintain a livable atmosphere.

How it's done:

The secondary pressure envelope is 72 inches long, 28 inches in diameter, and has hemispherical ends. A contained aluminum panel provides inflation and exhaust valves and an electrical connector for communication and biomedical measurements. Provisions for explosionproof lighting, sufficient for normal vision, are incorporated in the cell. The pressure-sealing zipper extends vertically along one side of the cell to just short of the apices. The cell is designed and packaged to permit unpacking, connecting to a pressurization system, and readiness for entry within a maximum time of 30 seconds.

The user enters the unfolded cell, closes and inflates it. He removes his spacesuit once the cell is ready and is free to eat, drink, dispose of body wastes, perform body cleansing, and obtain relief from the

(continued overleaf)

discomfort of extended pressurization in the spacesuit. After completing these tasks he dons and inflates his spacesuit, deflates the cell and stores it. The environment cell is reusable.

Notes:

1. The environment cell provides a safe pressure and atmosphere in a shorter time than is required to don and pressurize a spacesuit. It provides emergency pressurization in the event of spacesuit damage or malfunction. In medical emergencies, when a higher pressure might prove beneficial, a presurization up to 5 psi above ambient can be provided. As an emergency external environment, the cell is capable of withstanding 1×10^{-4} mm Hg pressure and 0° to 150° F for 100 hours.
2. Possible commercial applications include a low cost, lightweight emergency decompression chamber to transport divers suffering from the "bends" to a decompression chamber.
3. Inquiries concerning this innovation may be directed to:

   Technology Utilization Officer
   Manned Spacecraft Center
   Houston, Texas 77058
   Reference: B66-10370

Patent status:

No patent action is contemplated by NASA

Source: J. Tarr and S. Shelton
of North American Aviation, Inc.
under contract to
Manned Spacecraft Center
(MSC-648)